Fig. 12. Part of hind femur and tibia of *Idotasia scaphioides.*
Fig. 13. Head of *Osphilia apicalis.*
Fig. 14. Right fore leg of *Xychusa larvata.*
Fig. 15. Front view of the head of *Semiathe ophthalmica.* The eyes are scarcely large enough, and not sufficiently approximate.

XXXIV.—*Note on* Prof. Cope's *Interpretation of the Ichthyosaurian Head.* By Harry G. Seeley, F.G.S., Assistant to Prof. Sedgwick in the Woodwardian Museum, University of Cambridge.

Professor Cope, in the 'American Naturalist' for October 1870, published an illustrated abstract of his recent memoir on the crania of the lower Vertebrata. By the aid of these figures many readers will become conversant with the curious new interpretations which are among the results of Prof. Cope's labours; and this consideration leads me to offer the following remarks upon the abstract of the memoir. As a briefer notice has already been reprinted in the 'Annals' (1871, vii. p. 67), it may be enough to state that from study of the skull-bones which are immediately connected with the quadrate bone, Prof. Cope finds that previous writers have not accurately determined the cranial elements in Ichthyosauria, Dicynodontia, and others of the Monocondylia. And the questions raised are questions of fact, concerning one or two of which it is necessary to ask, Do the alleged facts exist? and if they exist, are they truly interpreted in the figures? On one point, that of the new interpretation of Ichthyosauria, we have good materials in England for forming a judgment; and having had occasion in the last few years to study these specimens in detail, I will endeavour to make Prof. Cope's positions intelligible.

First he finds at the back of the external nostril in *Ichthyosaurus* two small bones which are named the nasal bones. There is no antecedent improbability in this determination; the nasal bones commonly have such a position in all the Vertebrata, and any deviation from such a plan may be regarded as exceptional. A consequence, however, of such an identification is that a bone which Prof. Cope regards as the principal frontal bone (nasal of authors) enters into the nostril also; and against this there is a *prima-facie* probability, because the frontal bone has no such relation in vertebrates. But the improbability is lessened when the nostril of *Ichthyosaurus* is seen to occupy the position usually held by the middle hole of the skull (seen in Ornithosaurs, Dinosaurs, Teleosaurs, &c.); and with that anteorbital perforation it may

be supposed to be confluent. But even with this view there remains an improbability against the nostrils being mesially divided by the principal frontal bones, inasmuch as it is only among mammals, from which the prefrontal and postfrontal bones have disappeared as separate elements, that the frontal bone ever enters into the anteorbital vacuity. Prof. Cope, by what is probably an oversight in lettering the figure, makes the lachrymal bone enter the alveolar border and carry teeth, by which it is excluded from entering into the orbit. These relations are so entirely unparalleled, that I can only account for the determination on the supposition that, in printing, the letters intended for the maxillary and lachrymal bones became interchanged. On this view, the anterior narine would be surrounded by the premaxillary, frontal, nasal, and lachrymal bones—though, according to the lettering, for lachrymal we should read maxillary.

Now, do the European Ichthyosaurs support the interpretation which Prof. Cope makes from a head from the Lias of Barrow-upon-Soar? I do not find such a bone in any of the materials (drawings, photographs, and specimens) to which I have access; and these include species from several formations, both English and French. I do not wish to urge this negative evidence as proof that the bone does not exist, but only to show that, if it does exist in Prof. Cope's specimen, he possesses an animal which differs in remarkable generic characters from *Ichthyosaurus*. And this view might be regarded as supported by the figure; for we miss from its place, posterior to the postorbital bone, an osseous supraquadrate element which has hitherto been found to mark every Ichthyosaurian cranium. And Prof. Cope's other modifications all point in the same direction, and make an animal which mimics *Ichthyosaurus*, but differs from that type in all its most essential characters. Thus, in the new Barrow specimen, the squamosal bone takes upon itself the ordinary functions of the parietal, whereas in *Ichthyosaurus* the squamosal is much such a bone as it is in the Teleosauria; and in no Ichthyosaur known to me do the squamosal bones extend up the side of the cranium and meet mesially, as they are shown to do in one of Prof. Cope's figures. In consequence of this identification, all the superior cranial bones are moved a place backward, what were regarded as parietals now being squamosals; the frontals are parietals, and the nasals frontals, while the nasals are replaced by the new bones already discussed.

In view of the supposition that we have here a new genus, it is difficult to believe that a naturalist so acute and accomplished as my friend should have overlooked such a

possibility if it existed; but it would be much more easy, if the squamosal suture with the parietal bone had become obliterated, and the specimens studied were few, to suppose that the difficulty could be so explained. The existence of that suture, which is usually well seen, would restore to all the bones of the upper part of the head their usual names; and in view of the large serpent-like development of the parietals in *Ichthyosaurus*, it is not easy to bring one's self to call them squamosals if any other explanation can be given. There would then (excepting also the loss of the supraquadrate bone) be nothing to distinguish the *Ichthyosaurus* under discussion from other Ichthyosaurs but the anomalous little bones at the back of the nostril, which could neither be nasal nor any named element of the skull. Than that a new bone should appear in such a place it would seem less improbable that the obscure element should be an accidental dismemberment of an adjacent bone—probably a part of the lachrymal, which usually extends over the area which the supposed new bone occupies. The lachrymal is often fractured, even in crania which have preserved their natural form.

Prof. Cope's nomenclature of the bones of the lower jaw does not accord with the structures of any Ichthyosaur known to me. The articular bone is not a long external splint element, as shown in his figure, but is shaped more like the hoof of an odd-hoofed mammal, and is usually so enclosed in the jaw as only to display its articular surface, and is never seen in a view of the external part of the jaw.

There are many points in the Ichthyosauria worthy of attention; and on the relation of the immature to the adult animal I trust soon to be able to offer some new evidence.

XXXV.—*On two undescribed Sponges and two* Esperiadæ *from the West Indies; also on the Nomenclature of the Calcisponge* Clathrina, *Gray*. By H. J. Carter, F.R.S. &c.

[Plate XVII.]

In Dr. Bowerbank's 'Monograph of the British Sponges,' published by the Ray Society in 1864, there are two illustrations of foreign sponges without names (viz. figs. 289 & 292, vol. i.), the former of which is stated to be "West Indian," and the locality of the other is not mentioned.

For these two sponges Dr. Gray, in his "Notes on the Arrangement of Sponges" generally, has proposed the names of *Ectyon sparsus* and *Acarnus innominatus* respectively (Proc. Zool. Soc. 1867, pp. 515 & 544).